

his African Birds prior to publication, the end of the month, I shall bear in mind what you say on the Woodpecker but I have peculiar notions on *Species*, which, as I believe them correct, so I do not suffer to be influenced by the opinion of others, you will see more of this in my Book of American Birds. Our kindest remembrance to Mrs. Audubon, and always look upon me as your sincere, but very plain spoken friend.

W. SWAINSON.

"P.S. I had a long letter from Chas. Bonaparte¹ the other day, Vigers² is gone to Rome!!

"J. J. Audubon
c/o Mr. Thomas Fowler, Bookseller,
Manchester."

"Answered 29th Aug. 1830. J. J. A."

PLUMAGE WEAR IN ITS RELATION TO PALLID SUBSPECIES.³

BY JONATHAN DWIGHT, JR., M. D.

A MORE progressive generation of ornithologists will no doubt possess itself of higher standards for estimating the value of subspecies. At present the standards are shifting, dependent too much upon individual opinion and often entirely inadequate, even in the hands of trained observers. Under these circumstances it is not surprising that geographical races are viewed with disfavor by many who realize their shortcomings. The millennium has not arrived when the worn and faded breeding bird will be discarded as an unreliable basis for subspecies, and many of our races rest

¹ Charles Lucian Bonaparte. Born 1803—died 1857.

² Nicholas Aylward Vigers. Born 1787—died 1840. Naturalist. First Secretary of the Zoölogical Society of London.

³ Read at the Twenty-second Congress of the American Ornithologists' Union, Cambridge, Mass., November 29, 1904.

to-day upon no better foundation than a handful of worn specimens. The question to which I wish to direct special attention is whether in describing geographical races sufficient distinction has been made between the effect of climate on the feather and of climate on the species. In one case the feather alone yields to environment, in the other the species yields, and there is a wide difference between the two. The pallid races of arid regions, where dry atmosphere and sunny skies are most potent bleaching agents, will illustrate my meaning. If the feather at the time of its growth reflects climatic conditions by its paleness, we have here an inherent character that may very properly be made the basis of a subspecies, but if on the other hand the feather differs in no wise from one growing in a land of moisture and fades only as the months roll by, its fading is an accidental character that ought never to be recognized by a subspecific name. There are those who fail to grasp this distinction and believe in naming differences whenever found; but the real question at stake is not whether the paleness is of sufficient degree to merit a name, but whether the color is an intrinsic character. No one would think of calling a sunburnt man a subspecies, but the sunburnt plumage of the breeding bird is a fair mark for subspecific description!

The importance of the matter at once becomes obvious when we consider how many races depend for their recognition upon shades of color in breeding birds, and how little is known of the perfectly fresh plumage of these same birds. The effect of wear has been taken into account very little in naming them or perhaps largely guessed at, and what is most needed to-day is definite information regarding all the plumages of subspecies. This is no insignificant task, and though a thankless one it will be well worth the doing. My present intention is merely to call attention to it, for until moulting birds, which alone show the perfectly fresh plumage, are more abundant in collections than they are to-day, very little progress can be made in this direction.

A number of reputable subspecies might be selected to illustrate how little the matter of wear has been taken into account in naming them, but a few will suffice to show that I am not dealing wholly with generalities. As a familiar example of a pallid desert race, I have chosen the Desert Sparrow Hawk (*Falco sparverius*

phalena), for in examining a series of over 200 Sparrow Hawks I have found an unusual number in the midst of moult, making accurate comparisons of old and new plumages possible. On comparing newly-moulted specimens from eastern North America, from the Mississippi Valley, from the Rocky Mountains, from British Columbia, from California, and from Arizona, I find that the fresh plumage of birds from all of these widely differing regions is identical. This is true not only of adults but of young birds in all plumages. Under these circumstances it is only possible to conclude that Sparrow Hawks after a moult fade into pale *phalena* in a dry climate, remaining darker wherever the atmosphere is more humid. Furthermore, it is significant that during the breeding season when *phalena* is perhaps most typical, the humidity of the air at Denver, we will say, is below 50% while in Boston or New York the average is above 70%. Similar conditions prevail at the time of the prenuptial moult, for the fresh plumage of the Arizona bird is as dark as that of the Eastern, and only fades on exposure to the hot dry air of the Southwest. As *phalena* therefore possesses no intrinsic character, it should not possess a name. The plumage is sunburnt, but there is none of the incipient variation of which races are thought to be the exponent. It is perhaps fortunate that the describer of *phalena* did not name the other "regional phases" that he was able to distinguish. What is true of the Sparrow Hawk is undoubtedly true of other species, but it is far easier to describe a race than it is to produce evidence that invalidates it, and easier still to confuse wear with subspecific characters.

Most writers have concerned themselves with the effect of climate on the species, not its effect upon the individual. Mr. Grinnell, however, has discussed the effect of wear upon several California species (Auk, 1902, pp. 128-131). He states that a race of the Russet-backed Thrush known as *adica* does not in early summer differ from typical *ustulata* taken in Sitka, Alaska, but later in the season fades in the drier, brighter atmosphere of California. This is unquestionably true, and I have satisfied myself of the fact by the examination of numerous specimens. It is desirable, however, to compare fresh plumages; still, in the case of this Thrush, unless the new plumage is alike in both forms

at the period of the last moult, California breeding birds could hardly be matched by those from Alaska.

My conclusions in regard to the American Goldfinch (*Astragalinus tristis*) are along this same line (Auk, 1902, pp. 149-164). I stated that I could find practically no difference in color between the fresh plumage of the California race *salicamans* and that of the eastern bird. In this case, however, the eastern Goldfinch seems to be the pallid race, and this is naturally to be expected, for where *salicamans* is found on the Pacific Coast the humidity averages about 10% greater than in the East.

Some plumages and some colors yield more rapidly to wear while others are practically unsusceptible, especially those plumages having metallic colors like the Hummingbirds or Swallows. It is perhaps significant that there are few races of these and similar species. The Cliff Swallow (*Petrochelidon lunifrons*) that builds his nest in the shadow of the desert mesas differs not a whit from his brother that skims the green fields of New England, nor does the plumage of the Dove (*Zenaidura macrura*), so widely distributed over both humid and arid portions of the United States, yield to atmospheric variations. There is, however, an odd exception in the case of the Purple Martin (*Progne subis*), of which a pale race *hesperia*, has been described based entirely on characters of the adult female. As a matter of fact she yields to climatic influences only at the points (the collar, the forehead, etc.) where she lacks metallic feathers. The male, on the other hand, being wholly steel-blue and resistant at every point, shows no variation from season to season. There does, however, seem to be one slight character in the somewhat whiter tail-coverts of the western female, but it does not hold in young females nor in young males, both eastern and western birds having the tail-coverts equally white. We have, therefore, at best, a race which rests upon one weak character, peculiar to one sex, and to the adults only of that sex.

The immediate and obvious effects of humidity as a preservative of plumage have not been carefully estimated in individual races and if a bird must be caught on its breeding ground to tell what subspecies it belongs to, it looks as if there might be something wrong with the subspecies. Take the case of Alma's

Thrush (*Hylocichla ustulata almæ*) which it is claimed differs from *swainsoni* by its grayer coloration, a character that would seem more likely to have been inherited from northern ancestors than imposed by present climatic conditions. I have compared a good many breeding birds from Alaska with others from Eastern Canada and the difference between them is very slight and not easily made out. The Alaska birds average slightly grayer but I have seen several Canadian specimens that are typical *almæ*. What the variation in the fresh plumage of *almæ* may be I do not know, but *swainsoni* shows so great individual variation, that I think it would be mere guesswork to call pale winter birds taken in Texas, we will say, *almæ* and dark ones *swainsoni*. Here again I believe the validity of the subspecies turns on the comparison of fresh plumages which are not at present available, and the same thing may be said of the Juncos and the Horned Larks and a dozen other species of birds whose limits of variation in fresh plumage are quite unknown. Among the thousands of birds in collections a very small percentage throw light upon this matter, and until new plumages are thoroughly studied there is ample justification for regarding many of the pallid races with suspicion. To place them on a thoroughly scientific basis, eliminate the direct effects of wear and the characters which remain will represent to a greater or lesser degree geographical variation. Unless I am much mistaken subspecies will eventually be recognized by better characters than those visible in breeding birds alone, and will represent more thorough work than the mere matching of shades of color or averaging of dimensions. The discovery of new races will mean more work and less play.